

FREEZE TOLERANT FUEL CELL POWER PLANT WITH A
TWO-COMPONENT MIXED COOLANT

Abstract of the Disclosure

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A freeze tolerant fuel cell power plant (10) includes at least one fuel cell (12), a coolant loop (42) having a porous water transport plate (44) secured in a heat and mass exchange relationship with the fuel cell (12) and a coolant pump (46) for circulating a coolant through the plate (44) and for transferring water into or out of the plate (44) with the coolant. A coolant heat exchanger (52) removes heat from the coolant, and an accumulator (66) stores the coolant and fuel cell product water and directs the product water out of the accumulator (66). The coolant is a two-component mixed coolant liquid circulating through the coolant loop (42) consisting of between 80 and 95 volume percent of a low freezing temperature water immiscible fluid component and between 5 and 20 volume percent of a water component.